PRELIMINARY REMARKS

Applicants have studied the office action mailed April 7th, 2003 in connection with the above-identified patent application, and respectfully request consideration of the remarks herein. Applicants kindly thank the Examiner for her indication that claims 48 and 50 would be allowable if re-written in independent form.

Amendments to Specification

Applicants have amended the specification to correct a typographical error in the brief description of FIG. 6. Applicants have also amended the specification to remove a hyperlink and to replace the same with a description of how one may generally access the page on the world wide web to which the deleted hyperlink pointed. Accordingly, no new matter has been introduced by way of these amendments, and entry thereof is respectfully requested.

Amendments to the Claims

Claims 1-18 and 44-68 are pending in the instant Application. With this Amendment, Applicants have amended claims 1, 2, 4, 5, 9, 11, 13-15, 18 and 54-62 to resolve various issues of antecedent basis. As discussed hereinbelow, support for these amendments can be found in the specification as filed. No new matter has been introduced by way of these Amendments. Accordingly, Applicants respectfully request the Examiner's consideration and entry thereof into the file history of the instant application.

References Accompanying Applicants' List of References Cited, and embedded hyperlink

Applicants thank the Examiner for drawing their attention to the incomplete copies of IDS references AL (EP 414 140 A2, to Asano *et al.*) and AN (EP 687 136 A1, to Baum *et al.*), in her office action mailed April 7th, 2003. Applicants furnish herewith a Supplemental Information Disclosure Statement, accompanying which complete copies of the respective references are provided, and apologize for any inconvenience caused to the Examiner.

In respect of IDS reference BI (referred to by the Examiner as "Thesaurus by Zumer *et al.*"), the Examiner has concluded that the reference was "not formally supplied since ... the 3 pages of hard copy appear to be essentially a table of contents." Applicants respectfully disagree. The 3 pages supplied constitute the entirety of the website listing, and are not so

much a "table of contents" but a list of terms (*i.e.*, a thesaurus) that are used in connection with liquid crystal technologies. The listing is described as such in the portion of Applicants' disclosure that cites to it (page 9, lines 18-19). Accordingly, Applicants affirm that the printout furnished in Paper #4 is a hard copy of the web site referred to, and request the Examiner's consideration thereof.

Furthermore, Applicants believe that their presentation of a hard copy of the web-site listing is in accordance with PTO practice (see MPEP §§ 609, 707.05(e)). In particular, MPEP § 609 requires that an "information disclosure statement must include a legible copy of ... (D) All other information or that portion which caused it to be listed." Applicants have provided such a legible copy of the web-site in question. Furthermore, MPEP § 707.05(e) indicates that it is permissible to cite to an electronic document such as a web-site (Internet) listing.

Finally, as discussed hereinabove, Applicants have amended the specification to delete the embedded hyperlink at page 19, in response to the Examiner's request. Accordingly, Applicants respectfully request the Examiner's consideration of IDS reference BI.

REJECTIONS OF THE CLAIMS

Rejections under 35 U.S.C. § 112 (¶ 1)

The Examiner has rejected claims 66 and 67 as allegedly containing subject matter which was not described in the specification in such a way as to reasonably convey that the inventor(s) had possession of the claimed invention at the time the application was filed. Specifically, the Examiner alleges that the only support in the original specification for the use of "particle beams" is in original claim 37 (38 as renumbered), and at page 30, lines 29-33. The Examiner then alleges that "claim 66 as amended is broader than the original disclosure, because 'transformation ...' encompasses broader types of reactions than the disclosed decomposition of exacted [sic] state processors [sic]." Applicants respectfully disagree.

First, Applicants' specification additionally describes the use of particle beams, at page 19, lines 2-8. In particular, Applicants' specification teaches that "[t]he ion or electron beam is directed onto the film of precursor causing reaction to produce the metal containing material in the exposed areas." (Specification as filed, page 19, lines 3-5). Accordingly,

Applicants' specification supports broader types of reactions than "decomposition of excited state processes."

Second, Applicants understand the Examiner to be alleging that claim 66 as amended is broader than original claim 37 (38 as renumbered). In response, Applicants argue that the language "undergo a transformation", as found in amended claim 66, is no broader than the language "be transformed", as found in original claim 37 (38 as renumbered), and thus that claim 66 is supported by the claim as originally filed. If Applicants have mis-understood the Examiner's analysis, they kindly request her clarification.

The Examiner has also rejected claims 66 and 67 because the specification allegedly does not enable any person skilled in the art to which it pertains, to use the invention commensurate in scope with these claims. Specifically, the Examiner believes that the only support for claims 66 and 67 in the specification as filed is for "decomposing ... metal complexes via populating desired excited states" (as found on page 30 of the specification) and thus that support for any other type of transformation is allegedly lacking. Applicants respectfully traverse the rejection.

As discussed hereinabove, Applicants' specification, at page 19, lines 2-8, provides support for using a particle beam to cause a "reaction to produce the metal containing material", in a similar manner to the use of electromagnetic radiation to produce a photochemical reaction. Furthermore, Applicants' specification contains sufficient teaching for one of ordinary skill in the art to appreciate the range of types of reaction that can produce metal-containing material. Specifically, although the Examiner has highlighted the term "decomposition of excited states", this is no more than a general description of an underlying mechanism in photochemistry — that an incident photon excites a molecule that absorbs it into an excited state. Pages 24–25 of the specification as filed outline a number of different types of excitation that could give rise to a decomposition consistent with the process of the present invention. From this, one of ordinary skill in the art would appreciate exemplary types of excitation that an incident particle from a particle beam would effectuate in order to achieve a decomposition according to the process of the present invention.

Accordingly, Applicants point out that the specification as filed is enabling for types of transformation other than decomposition through excited states and respectfully request the rejections under 35 U.S.C. § 112 (first paragraph) to be removed.

Rejections under 35 U.S.C. § 112 (¶ 2)

The Examiner has rejected claims 2-6, 11, 18 and 66-67 as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Examiner has objected to a number of terms in the claims, as discussed hereinbelow.

The Examiner has suggested that it is unclear whether the term "photo-chemical reaction" in claim 2 is the same as that in claim 1, at (b). Applicants respectfully point out that the term "photo-chemical" reaction is being used to describe the reaction in question and its meaning would be clear to one of ordinary skill in the art. Applicants' specification, at pages 24--25, under the heading "[p]hotochemistry" has discussed various types of photochemical reaction. The Examiner is correct to conclude that, since the photo-chemical reaction in claim 2 need not be carried out in the same atmosphere as that in claim 1, and since the electromagnetic radiation in question need not be of the same frequency in claim 1 as in claim 2, then the two photo-chemical reactions need not be the same as one another. To this end and to clarify this point, Applicants' have amended claims 1 and 2 to differentiate the order of the two photo-chemical reactions by using the qualifiers "first" and "second". It is to be understood that this amendment does not constitute an admission that the first and second photo-chemical reactions are necessarily different from one another.

The Examiner has similarly objected to the occurrence of the term "one or more ligand byproducts" as found in claims 1 and 2. Similarly, Applicants have amended claims 1 and 2 to recite, respectively, "one or more ligand byproducts of a first kind" and "one or more ligand byproducts of a second kind."

Applicants are puzzled as to the Examiner's objection to the term "electromagnetic radiation", because in claim 1 it is identified as "electromagnetic radiation from a first source", and in claim 2 it is identified as "electromagnetic radiation from a second source". Accordingly, Applicants believe that it is clear that there are two sources of electromagnetic radiation recited in the claims, though these two sources need not be different from one another (as illustrated in the specification as filed, at page 16, lines 26-28).

The Examiner asks the question: "[i]s claim 5 indicating that 2 sources of the same UV are used or what [sic]?", thus illustrating what she considers to be one potential source of ambiguity and possibly the root of her overall objection. While Applicants still believe that one of ordinary skill in the art would not have any difficulty in understanding the terminology employed, in the interests of expediting prosecution, Applicants' have amended claims

depending from claim 1 or 2 so that the distinction between the two sources of electromagnetic radiation is made clear.

The Examiner has pointed out that claims 1, 2 and 66 are not constrained on their face to a particular ordering of performing steps (a), (b) ... (e) and that "[p]ositive temporal and/or spacial [sic] limitations would remove this uncertainty." The Examiner's main point seems to be that in each of the identified claims, the driving off of unreacted metal complex (in (c) or (e)) would render subsequent steps superfluous. Applicants respectfully disagree. Specifically, the Examiner's attention is drawn to the fact that claim 1 recites making a pattern by exposing a first area, and claim 2 recites exposing a second area. As is clear from the specification as filed at pages 15–17 and FIG. 4, the two areas are non-overlapping. Thus, driving unreacted metal complex in step (c) has no consequence for performing steps (d) and (e), and vice versa.

Furthermore, Applicants believe that the amendments to claims 1 and 2 presented herein, in which various instances of insufficient antecedent basis have been attended to, also serve to address the alleged temporal uncertainties identified by the Examiner. For example, (c) and (e) could not both be before (d) because the claim expressly states that the "ligand byproducts of a second kind" are actually *formed* in step (d), whereas step (e) merely refers to driving a remainder of them off. Additionally, step (e) could not be presented before step (d), because the term "ligand byproducts of a second kind" referred to in step (e) would itself lack antecedent basis, if it were not presented after (d). Thus, Applicants respectfully assert that the claims, on their face, contain sufficient temporal and spatial constraints to permit one of ordinary skill in the art to deduce which steps could be interchanged with one another, without introducing further limitations.

The Examiner has rejected claim 11 as being allegedly "vague and indefinite" for reciting the term "annealing temperature." The Examiner regards that such a temperature is "not an innate feature" and is thus an "unknown virtually unlimited temperature." Applicants respectfully disagree. The annealing temperature of a metal-containing material is discussed in the specification as filed, at page 18, lines 18-21. As would be understood by one of ordinary skill in the art, the annealing temperature of a particular material is not "virtually unlimited" but is determined by the propensity of the material to diffuse into other materials with which it is in contact. Thus, one of ordinary skill in the art would as easily understand that an annealing temperature is an ascertainable temperature for a particular material, as one

would understand the terms "boiling temperature" or "freezing temperature" to be defined temperatures.

Finally, the Examiner has rejected claim 18 (referred to as "claim 17" by the Examiner on page 5 of her office action) for reciting a narrow range limitation within a broad range limitation, by using the term "such as". With the instant amendment, Applicants have amended claim 18 to remove the item "such as norbornyl" from the Markush group.

Accordingly, upon entry of the instant amendment, Applicants respectfully submit that the rejections under 35 U.S.C. § 112, second paragraph have been mooted and the Examiner is kindly asked to withdraw them.

Applicants note in passing that the Examiner has cited to a definition of liquid crystal materials in a publication by Ciferri. As Applicants did not provide this reference to the Examiner, and did not cite to it in the specification of the instant patent application, Applicants kindly ask the Examiner to supply a copy to Applicants or to make it of record in the file history of the instant application.

Rejections under 35 U.S.C. § 103

The Examiner has rejected claims 1–4, 7, 18–44, 49, 52 and 54–67 under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 5,534,312 to Hill (the "'312 patent") in view of U.S. Patent No. 4,199,649 to Yundt ("Yundt"). The Examiner has also rejected claims 1–16, 44 and 51–67 as allegedly being unpatentable over U.S. Patent No. 5,534,312 to Hill (the "'312 patent") in view of U.S. Patent No. 5,348,775 to Lin ("Lin"). Applicants respectfully traverse the rejections.

When rejecting claims under 35 U.S.C. § 103, the Examiner bears the burden of establishing a *prima facie* case of obviousness. *In re Bell*, 26 U.S.P.Q.2d 1529 (Fed. Cir. 1993). To establish a *prima facie* case, three basic criteria must be met. MPEP § 2143. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify or combine the reference teachings in the manner suggested by the Examiner. Second, the skilled artisan, in light of the teachings of the prior art, must have a reasonable expectation that the modification or combination suggested by the Examiner would be successful. Finally, the prior art reference, or references when combined, must teach or suggest each and every limitation of the claimed invention. MPEP § 706.02(j). The teaching or suggestion to make the claimed invention and the reasonable expectation of success must both be found in the

prior art, not in the Applicant's disclosure. *In re Vaeck*, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). If any one of these criteria is not met, *prima facie* obviousness is not established.

In respect of the rejection over Hill in view of Yundt, Applicants respectfully submit that one of ordinary skill in the art would not have had a motivation to combine Yundt with Hill, because Hill teaches away from using photo-resists, and Yundt uses a photo-resist.

To elaborate, Hill teaches a "*photoresist-free* method for making patterned films of ... metal containing compounds" (Hill, abstract (emphasis added)). In general, Hill teaches away from using photo-resists: "[T]he process does not require the steps of applying and removing a photo-resist or similar material to the structure being fabricated." (Hill, Col. 3, lines 60–63). By contrast Yundt describes a method of bringing a thin film in contact with a photo-resist (see, *e.g.*, Yundt, claims 1 and 5). Accordingly, one of ordinary skill in the art would not have been motivated to combine the teachings of Hill and Yundt because each is directed to a distinct method of deposition, and because, knowing the teachings of Hill, one of ordinary skill in the art would have looked towards other photo-resist free methods of deposition for selection of photo-chemically active metal containing compounds, and not to the teachings of Yundt.

Furthermore, Applicants respectfully submit that one of ordinary skill in the art would not have had a reasonable expectation of success in combining the teachings of Hill and Yundt, because Yundt does not teach materials that undergo photochemical reactions in the manner of Hill, but instead refers to photochemical reactions that involve the photo-resist or a substrate surface.

Specifically, Applicants respectfully point out that the Examiner has mis-read Yundt's supposed teaching of a photo-chemical reaction (Yundt, col. 13). Yundt does not teach a "photo-chemical reaction" for transforming a metal complex into a metal containing material adherent to a substrate, as recited by Applicants' claims. In fact, the photo-chemical reactions taught by Yundt are not reactions undergone by the silicone fluids in the thin film, but are reactions on the surface of the substrate or a photo-resist. For example, Yundt at col. 13, lines 48-51 talks about altering the manner in which the coating attaches to the substrate: "... whereupon photochemical reactions occur which selectively either produce *bonding sites* where previously absent or effectively *destroy the attachment* of the coating to the substrate." (emphasis added). Additionally, Yundt, at col. 13, lines 51-55 considers altering the photo-resist, and not the silicone layer itself: "... a base coat of conventional photosensitive resist *beneath the surface treatment* of this invention might be caused to become stabilized or

insolubilized locally where illuminated." (emphasis added). Accordingly, one of ordinary skill in the art would not have supposed that the materials used in the coatings of Yundt would have been suitable for use with the method of Hill.

Regarding the rejection over Hill in view of Lin, Applicants note that Hill teaches "applying an amorphous film of a metal complex to a substrate and then selectively converting portions of [the] film to different metal containing materials by photo-chemically reacting selected portions of [the] film in a selected atmosphere." (Hill, Col.3, lines 63–67, (reference numerals omitted)). However, Lin teaches a method of producing patterns of ferro-electric materials ("PT", "PZT", and "PLZT") on a substrate using laser-writing on a precursor compound mixed with a surfactant. Applicants respectfully point out that, just as with Yundt, Lin also does not teach a "photo-chemical reaction" for transforming a metal complex into a metal containing material adherent to a substrate, as taught by Hill. For example, the Examiner has stated that "Lin teaches alternative curing techniques" but has not identified photo-chemical methods therein. Accordingly, one of ordinary skill in the art would not have had a reasonable expectation of success in combining the teachings of Hill and Lin since the materials used by Lin are not disclosed to be photo-chemically reactive.

Additionally, the Examiner has stated that Lin suggests the metal Fe (iron), and, because Ru (ruthenium) "is homologous [sic] with Fe", its use "would have been obvious ... given its place in the periodic table." In response, Applicants respectfully point out that Lin lacks a teaching of Fe containing complexes. Although Lin teaches "ferro-electric" materials, the ferro-electric phenomenon is not limited to iron-containing materials (it is a magnetic property), and the only metals taught by Lin are, in fact, Pb (lead), Zr (zirconium), La (lanthanum), and Ti (titanium), none of which is in the same group of the periodic table as ruthenium. If the Examiner disagrees with Applicants' conclusion, she is kindly asked to specifically point out the reference in Lin to iron-containing compounds.

In summary, one of ordinary skill in the art would not have had reason to suppose that the teachings of Lin could have successfully been used in conjunction with those of Hill.

Accordingly, Applicants respectfully submit that the rejected claims are not obvious over the cited references and request that the Examiner withdraw the rejection.

CONCLUSION

In view of the above remarks, Applicants respectfully submit that the subject application is in good and proper order for allowance. Withdrawal of the Examiner's rejections and early notification to this effect are earnestly solicited.

If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is encouraged to call the undersigned at (212) 790-9090.

No fee, is believed owed in connection with filing of this amendment and response. However, should the Commissioner determine otherwise, the Commissioner is authorized to charge any underpayment or credit any overpayment to Pennie & Edmonds LLP Deposit Account No. 16-1150 for the appropriate amount. A copy of this sheet is attached.

Respectfully submitted,

Date: July 7, 2003 By: Richard G. A. Bone

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Limited Recognition Under 37 C.F.R. § 10.9(b)
(Copy of Certificate attached hereto)

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